

WATER OFF-TAKE FROM LAYFLAT HOSE, SPECIAL FITTING FOR WATEROFF-TAKE FROM A FLEXIBLE FLAT HOSE (LAYFLAT)DESCRIPTION

The invention refers to the technical aspects of mounting secondary irrigation pipes to the main water supply pipe. In particular, it aims at the fitting of the secondary pipes to the main pipes, of the so called "layflat hose" type, meaning a hose from flexible plastic material with a flat surface.

- 5 Hoses with a flat surface offer the advantage to the farmer, after he has installed his water supply network, of being able to move any wheeled equipment or vehicle freely in the field, even passing over the layflat hoses, when they are not being used for irrigation and are not under pressure.

Using the current conventional technology, all central field irrigation lines are made either from
10 rigid or from semirigid pipes and the relevant accessories for fitting to the secondary irrigation lines are available in the market.

However these pipes have the following serious disadvantages and handicaps:

- High cost of purchasing and installation.
- No possibility of any vehicle or wheeled machinery passing through the field and over
15 the pipes, whilst the pipes are laid on the ground.
- When removed from the field they must be packed and coiled and furthermore an important amount of labour and cost is involved in their dismantling, transport, storage and reinstallation.

On the contrary, the layflat flexible hoses occupy minimal space, being flat when not under
20 pressure, and their coiling, handling and reinstallation in the field is very easy. The basic problem encountered until today in using layflat flexible hoses as central irrigation pipelines, has been and still is the lack of an appropriate fitting for the connection of the secondary irrigation pipes to the main layflat supply line.

Water off-takes of similar type are known, but with flat shape of the surface clamping on to the
25 layflat hose, after drilling the appropriate hole for insertion.

These off-takes placed in proper size holes, drilled on the wall of the layflat hose, do not offer full water proofness, resulting in the water coming into contact with the hose reinforcement yarns, thus causing the inflation of the hose and subsequent bursting of the walls after a short period of time.

30 This period depends on the pressure and temperature of the water, the type of yarn and the wall thickness of the hose. In this way, the inefficiency of the water off-taking fitting is attributed to a defect of the layflat hose.

The above mentioned problems led to the attempt of inventing a fitting ease to fit on the flexible

layflat hose and ensuring water tightness.

In this concept, the first objective of the present invention is to offer a special fitting for water off-take from the flexible layflat hose, preventing any water leakage at the point of connection of the fitting with the hose.

- 5 Another objective of this invention is to solve problems of initial cost, installation cost, endurance, functionability and life span of this fitting, by realising various structural and assembling combinations/solutions, which will be presented and described analytically herebelow and whereby all the forementioned advantages of the new fitting will become obvious.
- 10 The invention will be better understood by the specialists of the state of the art technique, by referring to the drawings attached to this description, in which some preferred applications of this invention are indicatively and not restrictively shown.

Figure 1 shows in perspective view the actual body of the water off-take fitting.

Figure 2 shows perspectively the conical sealing ring.

Figure 3 shows perspectively the grooved washer.

- 15 Figure 4 shows perspectively the screw nut tightening all the previous parts on the body of the water off-take 1.

Figure 5 shows perspectively the order of connecting up the previous four items one after the other.

- 20 Figure 6 shows in a cross-sectional side view the order of mounting the four items on the flexible layflat water hose.

Referring to a selected indicative example of industrial manufacturing of the invented fitting, a listing of the main components of the fitting is given herebelow, with reference to the numeration of the components on the attached drawings, whereby the components are represented not in scale but simply in terms of their size relative to each other.

- 25 According to the preferred indicative application of the invented special fitting for the water off-take from a flexible layflat hose, the terminology of the main components of the present invention is the following:

- 30 1. Water off-take body. It consists of the conical part no. 9, which has relieved coaxial contoured grooves and of the thread no. 10. The body is placed on the hose no. 6 in such a way that the conical part 9 is placed inside the hose 6 and the thread 10 protrudes from the hole drilled on hose 6, to accommodate the mounting of the body 1. The hole drilled on the wall of the hose 6 has a slightly shorter diameter than that of the thread 10.
- 35 2. Conical sealing ring. It has an inner conical surface 8 with relieved coaxial contoured grooves, similar to the ones of conical part 9. During tightening of the conical ring on the body 1, the wall of the hose 6 is compressed between the conical part 9 and the conical surface 8 and thus full tightness (sealing) is accomplished.

3. Washer placed between the conical ring 2 and the tightening nut. It has on one surface radiated grooves, which act as an escape route, should there be any water leakage through the threading 10 of the water off-take.
4. Tightening nut with internal threading similar to that of the body 1. It could also be a part of the fitting which will be further connected with the water off-take fitting.
5. Grooves on one side of the washer 3, to give passage to any water leakage through the thread of the water off-take.
6. Flexible layflat hose, on which a hole is drilled, suitable for the insertion of the conical part.
7. Polygonal hole on body 1, for reception of polygonal key, which facilitates tightening of body 1 onto the conical ring 2. The hole is used for the passage of water from the main line (layflat hose) to the secondary (lateral) irrigation pipe.
10. Inner conical surface of ring 2. Has coaxial contoured grooves similar to those of conical part 9.
9. Conical part of the body 1, which goes inside the hose 6 and the conical ring 2 is then compressed and fitted onto it. It has coaxial contoured grooves, so that the conical ring 2 can be tightened firmly on to it.
15. Thread on the upper part of body 1, used for screwing nut 4.

A variation of the tightening system of conical part 9 with conical ring 2 is to make body 1 with a flat ring on its end, instead and in lieu of the conical part 9 and use separate conical accessory, 20 which will be inserted between the flat ring and the conical ring 2.

The materials for the manufacturing of the above components could be different types of plastics or metals of any desirable shape.

It should be mentioned that the invented special fitting for water off-take as described above is not restricted by the above given example of industrial manufacturing.

25. The invented fitting can also be made using other manufacturing methods, processes and parts, which fall within the scopes and claims of the present invention.

The hereby preferred solution to the problem of water off-take from layflat flexible hose has been made with reference to the above mentioned indicative examples of application.